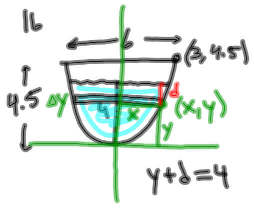


$\Delta F =$ pressure · area
$= k \cdot \text{depth} \cdot \Delta A$
$= 62.4(4-y)\,2x \cdot \Delta y$
$= 62.4(4-y)\,2\sqrt{2y}\,\Delta y$

$y+d=4$

$y = a\cdot x^2$ $\quad y=\frac{1}{2}x^2$

$4.5 = a\cdot 3^2$ $\quad x=\sqrt{2y}$

$\frac{1}{2} = \frac{4.5}{3^2} = a$

$$\int_0^4 62.4(4-y)\,2\sqrt{2y}\,dy$$

1,506.1 lbs

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$\int_a^b$ rate of change $dt$ = net change
(could be total change)

$$\int_a^b f'(t)\,dt = f(b) - f(a)$$

area between curves

vertical $\qquad$ horiz rect.

$$\int_a^b f(x)-g(x)\,dx \quad \text{or} \quad \int_c^d h(y)-j(y)\,dy$$

top bottom $\qquad$ right left

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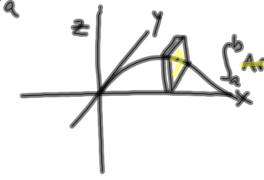
| volumes | dx vertical rect | dy horiz. rect. |
| --- | --- | --- |
| disks | $\int_a^b \pi r^2\,dx$ | $\int_c^d \pi r^2\,dy$ |
| washers | $\int_a^b \pi R^2 - \pi r^2\,dx$ | $\int_c^d \pi R^2 - \pi r^2\,dy$ |
| shells | $\int_a^b 2\pi r h\,dx$ | $\int_c^d 2\pi r h\,dy$ |

known cross sections




$\int_a^b$ Area $dx$

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| | vert | horiz |
| --- | --- | --- |
| length of curve | $\int_a^b \sqrt{1+\left(\frac{dy}{dx}\right)^2}\,dx$ | $\int_c^d \sqrt{1+\left(\frac{dx}{dy}\right)^2}\,dy$ |

work $= \int_a^b$ Force $dx$

fluid - slice $\quad \Delta W =$ force · dist
$=$ density · volume · dist

Force fluid $\quad$ slice $\quad \Delta F =$ pressure · area
$= k \cdot \text{depth} \cdot \text{area}$

Dec 16-10:04 AM